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ABSTRACTS

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Leukocyte count predicts microembolic Doppler signals during carotid stenting: A link between inflammation and embolization

Aronow HD, Shishehbor M, Davis DA, et al. Stroke 2005;36:1910-4.

Conclusion: Microembolic signals during carotid stenting are increased with increased preprocedure leukocyte counts.

Summary: Microembolization detected by transcranial Doppler imaging inevitably accompanies carotid artery stenting. The authors chose to study the relationship between microembolization during carotid artery stenting and preprocedure leukocyte count. Forty-three patients underwent simultaneous transcranial Doppler monitoring of the middle cerebral artery during carotid artery stenting. Microembolic signals detected by transcranial Doppler were used to quantify microembolization. Preprocedure leukocyte counts were then related to microembolic signals detected by transcranial Doppler.

The preprocedure leukocyte count in an unadjusted analysis was correlated positively with total procedure microembolic signals ($R^2 = 0.16$; $P = .008$). With adjustments for age, comorbidities, gender, medical therapies, and use of embolic protection devices, increasing leukocyte count ($\beta = 35$ for each $1000/\mu L$ increment; $P = .018$) remained an independent and significant predictor of microembolization (model-adjusted $R^2 = 0.365$; $P = .0005$). The relationship with increased leukocyte count was most marked in the third tertile of the leukocyte count, with a median number of microembolic signals being 259 in the first tertile, 276 in the second tertile, and 350 in the third tertile leukocyte count. Embolic protection devices were used in 16% of the population. Overall, 12% of the patients died, had a myocardial infarction, or had a stroke. For every $1000/\mu L$ increase in leukocyte count, transcranial Doppler detected 35 additional microembolic signals.

Comment: The association of increased leukocyte count with microembolic signals during carotid stenting is interesting. However, the patients reported in this series are unlikely representative of current practice in that only 16% underwent carotid stenting with cerebral protection devices. The 12% major procedural complication rate also seems high. Finally, the only marker of inflammation used in this retrospective study was leukocyte count. Further data using modern techniques and additional markers of inflammation such as C-reactive protein are required before a link can be established between inflammation and microembolization during carotid artery stenting.

Can computed tomography scan findings predict "impending" aneurysm rupture?

Boules TN, Compton CN, Stanziale SF, et al. Vasc Endovasc Surg 2006; 40:41-7.

Conclusion: Computed tomography (CT) signs of "impending rupture" are poor predictors of short-term aortic aneurysm rupture.

Summary: A number of signs that are present on CT scans have been advocated in the radiologic literature as indicating increased risk of rupture of abdominal aortic aneurysms and have been suggested to indicate "imminent" or "impending" aneurysm rupture (AJR 1994;163:1123-9). These signs include the "crescent sign," a curvilinear area of higher attenuation within the aneurysm that may represent hemorrhage into mural thrombus; ill defined or irregular aortic walls, discontinuity of circumaortic calcification, aortic bulges or blebs, and draping of the aorta over the spine.

This study reviewed a medical records system from August 1994 to August 2004 looking for CT scan reports of impending rupture. Medical records were also reviewed for patient demographics, symptoms, comorbidities, and documented subsequent aneurysm rupture, operative findings, or both. If a rupture occurred ≤2 weeks of the index CT scan, it was defined as supporting the imminent rupture diagnosis.

The record retrieval system identified 45 patients with aortic aneurysms and CT stigmata of impending rupture. Six patients were excluded because five had additional signs suspicious for leak and another had a previously repaired aneurysm and associated infection. Therefore, 39 intact aneurysms were evaluated, of which 26 (67%) were infrarenal, two (5%) were suprarenal, and 11 (28%) were thoracoabdominal. Mean aneurysm diameter was 6.8 ± 1.4 cm. Mean patient age was 74 years, and 49% were women. Ten patients underwent elective repair during the first 2 weeks that precluded adequate observation for early rupture. None of these patients had intraoperative signs of rupture. Two of the remaining 29 patients suitable for more long-term evaluation ruptured ≤72 hours of the CT scan. The positive predictive value of the diagnosis of impending rupture was therefore 6.9%. One other patient's aneurysm ruptured 7 months after the initial CT scan.

Twenty-six patients whose aneurysms did not rupture were observed over an average length of follow-up of 246 days (range, 14 days to 3 years). Of these patients, 14 were repaired electively 2 to 3 weeks after the CT scan, and 12 never underwent repair. These 12 were observed for a mean of 394 days without rupture.

Comment: Every vascular surgeon will at one time be faced with the dilemma of what to do with a patient with a large abdominal aortic aneurysm and a radiologic diagnosis of impending rupture without clear evidence of leakage from the aneurysm. Since the risk of acute rupture in these patients seems quite low, the authors' data suggest that an approach of expedient but not emergent operation is reasonable. Nevertheless, the weaknesses of these data are obvious in that only patients who had a diagnosis of impending rupture included in their official CT report were in the database. The data would have been more complete if the authors had also evaluated all patients with aortic aneurysm rupture and a previous CT scan. Perhaps some of these patients had signs of impending rupture that were not included in the official radiologic report.

Ankle-brachial index and subclinical cardiac and carotid disease: The Multi-ethnic Study of Atherosclerosis

McDermott MM, Liu K, Criqui MH, et al. Am J Epidemiol 2005;162:33-41.

Conclusion: Ankle-brachial indices (ABIs) <1.0 in men and <1.1 in women may be a marker for increased risk of cardiovascular event.

Summary: This is a study of the association of ABI and subclinical atherosclerosis. The study included 3458 women (average age, 62.6 years) and 3112 men (average age, 62.8 years). All were free of clinically evident cardiovascular disease. In each patient, measurements were made of ABI, carotid intimal-media thickness, and coronary artery calcium assessed by computed tomography (CT). The five categories of ABI were <0.90, 0.90 to 0.99, 1.00 to 1.09, 1.10 to 1.29 (considered the normal range), and >1.30.

Men with normal ABIs (1.10 to 1.29) had significantly less internal carotid artery intimal-media thickness than men with ABIs <0.90 (1.58 vs 1.09, $P < .001$). Those men with ABIs between 0.90 and 0.99 also had greater degrees of carotid artery intimal-medial thickness (1.33 vs 1.09; $P < .001$). Men with ABIs between 1.00 and 1.09 also had greater degrees of intimal-medial thickness in the internal carotid artery (1.18 vs 1.09; $P < .001$). Adjusted odds ratios for a coronary artery calcium score >20 decreased across progressively higher ABI categories in both women and men. P for trend in men was .0002, and P for trend in women was .0002.

Comment: The data suggest borderline and low-normal ABIs may really not be normal, and such patients are at higher risk of having increased degrees of coronary and carotid atherosclerosis. A truly normal ABI as a marker of a patient free of atherosclerosis may be slightly higher than previously suspected.

Experience with autogenous arterial venous access for hemodialysis in children and adolescents

Grademan WS, Learner G, Mentser M, et al. Ann Vasc Surg 2005;91:609-12.

Conclusion: Autogenous arterial venous access for hemodialysis is possible in virtually all pediatric patients and provides excellent long-term patency.

Summary: From March 1999 to April 2004, 47 consecutive children (31 boys, 16 girls) underwent construction of an autogenous arterial venous access for hemodialysis. The mean age was 14.6 years (range, 5 to 20 years). All patients underwent preoperative vein mapping. The types of access constructed were upper arm brachiocephalic in 15 cases, radial-cephalic in 16, transposed upper arm brachial-basilic fistulas in seven, and transposed femoral vein in seven. Three forearm cephalic veins and five upper arm cephalic veins required transposition. Femoral vein accesses were constructed in seven patients for exhaustion of upper extremity access and in two patients because of patient preference.

Primary access patency was 100% at 1 year and 96% at 2 years. Secondary access patency at 1 and 2 years was 100%. One access was abandoned after 27 months for thrombosis.

Comment: Clearly, autogenous access in the pediatric population can be performed with outstanding results. Although the vessels may be smaller in children, it appears that with proper surgical technique as well as proper planning and willingness to transpose veins as necessary, durable long-term autogenous dialysis access can be provided in the pediatric population.